

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

(Attorney Docket No. 15574US02)

In the Application of:

Rajendra Tushar Moorti, et al.

Serial No. 10/810,462

Filed: March 26, 2004

For: METHOD AND SYSTEM FOR
ANTENNA SELECTION DIVERSITY
WITH DYNAMIC GAIN CONTROL

Examiner: Charles Chiang Chow

Group Art Unit: 2618

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REPLY BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with 37 CFR 41.41, the Applicant submits this Reply Brief in response to the Examiner's Answer mailed on August 23, 2007 (hereinafter, "Examiner's Answer). The Examiner's Answer was mailed in response to the Applicant's Appeal Brief filed on June 18, 2007 in the above identified application (hereinafter, "Appeal Brief"). The Applicant has responded to the Examiner in the Examiner's Answer, as found in the following Argument section.

As may be verified in his final Office Action dated December 18, 2006 (hereinafter, "Final Office Action"), the Examiner had previously rejected claims 1, 9, 11, 19, 21 and 29 under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 5,648,992 issued to Wright et al. (hereinafter, Wright). See the Final Office Action at page 3. Claims 2, 4, 6, 12, 14, 16, 22, 24 and 26 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of US Patent No. 5,787,122 issued to Suzuki (hereinafter, Suzuki). See the Final Office Action at page 8. Claims 3, 7, 13, 17, 23 and 27 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of Suzuki and further in view of US Patent No. 6,922,549 issued to Lyons et al. (hereinafter, Lyons). See the Final Office Action at pages 9 and 11. Claims 5, 15 and 25 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of Suzuki and further in view of US Patent No. 5,481,571 issued to Balachandran et al. (hereinafter, Balachandran). See the Final Office Action at page 10. Claims 10, 20 and 30 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of Suzuki and further in view of US Patent No. 6,002,672 issued to Todd (hereinafter, Todd). See the Final Office Action at page 11.

STATUS OF THE CLAIMS

Claims 1-7, 9-17, 19-27, 29 and 30 were finally rejected. Claims 8, 18 and 28 were objected to. Claims 1, 9, 11, 19, 21 and 29 rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 5,648,992 issued to Wright et al. (hereinafter, Wright). See the Final Office Action at page 3. Claims 2, 4, 6, 12, 14, 16, 22, 24 and 26 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of US Patent No. 5,787,122 issued to Suzuki (hereinafter, Suzuki). See the Final Office Action at page 8. Claims 3, 7, 13, 17, 23 and 27 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of Suzuki and further in view of US Patent No. 6,922,549 issued to Lyons et al. (hereinafter, Lyons). See the Final Office Action at pages 9 and 11. Claims 5, 15 and 25 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of Suzuki and further in view of US Patent No. 5,481,571 issued to Balachandran et al. (hereinafter, Balachandran). See the Final Office Action at page 10. Claims 10, 20 and 30 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Wright in view of Suzuki and further in view of US Patent No. 6,002,672 issued to Todd (hereinafter, Todd). See the Final Office Action at page 11.

ARGUMENT

The present application includes pending claims 1-7, 9-17, 19-27, 29 and 30 which have been rejected in the Final Office Action. The Applicant respectfully submits that the claims define patentable subject matter. The Applicant requests reconsideration of the claims in view of the following remarks.

A. Rejection of Claims 5, 15 and 25 under 35 U.S.C. § 103 (a)

The Applicant first turns to the rejection of claims 5, 15 and 25 under 35 U.S.C. 103(a) as being unpatentable over Wright in view of Suzuki and in further view of Balachandran. In the Examiner's Answer, the Examiner concedes that the combination of Wright and Suzuki "fail to teach the antenna selection is based on prior history said selection of said portion of dwelled-on at least one of a plurality of antennas." See Examiner's Answer page 11. The Examiner then asserts that Balachandran does teach antenna selection based on the prior history of antenna selection. For support, the Examiner relies on Balachandran, col. 3, lines 10-35. In particular, the Examiner cites the hysteresis value referenced in Balachandran and asserts that the hysteresis value represents "prior history". The Examiner then concludes that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Wright, Suzuki with Balachandran' hysteresis value, in order to reliably selecting an starting antenna based on the previous hysteresis (sic). See Examiner's Answer, page 11.

The Applicant respectfully disagrees with both the Examiner's assertions and

conclusions. The Applicant supports this position by referring to Figure 3A in Balachandran, which shows that the hysteresis value is set at initialization and is not changed during operation. In this regard, **the hysteresis value is a predetermined value.** Even if one accepts the argument that the hysteresis value, as a predetermined value, is also a “prior history” value, which the Applicant respectfully asserts it does not, the Applicant respectfully submits that such an interpretation of the teachings of Balachandran would not reasonably lead to the conclusion that the hysteresis value is based on a *prior history of antenna selection* as is recited in claims 5, 15 and 25.

In response to the arguments set forth with respect to claims 5, 15 and 25 in the Appeal Brief, the Examiner's Answer attempts to buttress the above-mentioned rationale for rejecting claims 5, 15 and 25 by asserting:

Balachandran teaches the antenna selection based on the steps of determining a threshold value and a hysteresis value, as the prior history [column 3, lines 10-36]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to understand that the selection of the starting antenna could be based on the prior history, based on the teachings from Suzuki and Balachandran. See Examiner's Answer, page 17.

The Applicant once again respectfully disagrees with the Examiner's assertions and conclusions. The Applicant again supports this position by referring to Figure 3A in Balachandran, which shows that both the hysteresis value and the threshold value are set at initialization and are not changed during operation. In this regard, the hysteresis value is a predetermined value **and the threshold value is also a predetermined value.** For at least the reasons stated above the Applicant respectfully submits that the

teachings of Balachandran would not reasonably lead to the conclusion that either the hysteresis value or the threshold value is based on a *prior history of antenna selection* as is recited in claims 5, 15 and 25.

The Applicant therefore maintains that claims 5, 15 and 25 are allowable at least for the above reasons. The Applicant also maintains the arguments made with respect to claims 5, 15 and 25 in the Appeal Brief.

B. Rejection of Claims 6, 16 and 26 under 35 U.S.C. § 103 (a)

The Applicant next turns to the rejection of claims 6, 16 and 26 under 35 U.S.C. 103(a) as being unpatentable over Wright in view of Suzuki. Claims 6, 16 and 26 recite “determining a starting gain for said starting antenna based on an automatic gain control.” In the Examiner’s Answer, the Examiner asserts that Wright “teaches the gain controlling for selecting an antenna of the automatic gain control but fails to teach the selecting of a starting antenna.” See Examiner’s Answer page 9. For support, the Examiner relies on Figures 3 and 4 in Wright. In particular, the Examiner cites “the gain control 28 for the automatic gain control from processor 25” (from Figure 3) and “the procedures 108, 114, code, to select antenna” (from Figure 4). *Ibid.* The Examiner then asserts that Suzuki “teaches the comprising determining a starting antenna based on the previously determined sequential order.” *Ibid.* To support this assertion, the Examiner relies on Suzuki, column 9, lines 13-26. *ibid.*

The Applicant respectfully disagrees with both the Examiner’s assertions and conclusions. The Applicant supports this position by referring to Wright, column 5, lines

17-41, which teaches that the antenna diversity procedure 108 precedes the gain control procedure 110, and the gain control procedure 110 precedes the control of the diversity control indicator 114. Wright also teaches that subsequent to the gain control procedure 110, but prior to the control of the diversity control indicator 114, "the processor then waits for the beginning of the next transmit slot" (Wright, column 5, lines 26-27). The Applicant respectfully submits that since Wright teaches that gain control is effected for a "next transmit slot," at least one burst would have been received prior to performing the gain control procedure 110. In this regard, **Wright does not teach "determining a starting gain for said starting antenna based on an automatic gain control"** as is recited in claims 6, 16 and 26. The assertion by the Examiner that Suzuki teaches determining a starting antenna does not cure this deficiency. Consequently, the Applicant respectfully submits that the combination of Wright and Suzuki does not teach "determining a starting gain for said starting antenna based on an automatic gain control," as is recited in claims 6, 16 and 26.

In response to the arguments set forth with respect to claims 6, 16 and 26 in the Appeal Brief, the Examiner's Answer attempts to buttress the above-mentioned rationale for rejecting claims 6, 16 and 26 by relying on Figures 3 and 9 from Wright, along with the related descriptions in the specification, for support. See Examiner's Answer, pages 15-16. From this basis, the Examiner concludes: "it would have been obvious to one of ordinary skill in the art at the time the invention was made to understand that the starting gain for a starting antenna is determined by using an

Automatic Gain Control, from the teachings of Wright and Suzuki." See Examiner's Answer page 16.

The Applicant once again respectfully disagrees with the Examiner's conclusions. The Applicant again supports this position by referring to Figures 3 and 9 in Wright. Figure 9 in Wright discloses a detailed flowchart of the gain control procedures. The disclosure of additional details about the gain control procedure 110 from Figure 3, does not cure the defect, referred to above, that the gain control procedure 110 occurs subsequent to the antenna diversity procedure 108. Consequently, the Applicant respectfully submits that *even given the additional detail for the gain control procedure disclosed in Figure 9, Wright does not teach "determining a starting gain for said starting antenna based on an automatic gain control"* as is recited in claims 6, 16 and 26. Consequently, even in view of the Examiner's additional arguments submitted in response to the arguments set forth with respect to claims 6, 16 and 26 in the Appeal Brief, the Applicant still maintains that the combination of Wright and Suzuki does not teach "determining a starting gain for said starting antenna based on an automatic gain control," as is recited in claims 6, 16 and 26

The Applicant therefore maintains that claims 6, 16 and 26 are allowable at least for the above reasons. The Applicant also maintains the arguments made with respect to claims 6, 16 and 26 in the Appeal Brief.

C. Rejection of Claims 3, 13 and 23 under 35 U.S.C. § 103 (a)

The Applicant next turns to the rejection of claims 3, 13 and 23 under 35 U.S.C. 103(a) as being unpatentable over Wright in view of Suzuki and further in view of Lyons. Claims 3, 13 and 23 recite “selecting said starting antenna based on a predetermined criteria.” In the Examiner’s Answer, the Examiner concedes that the combination of Wright and Suzuki fails “to teach the selecting of an antenna based on a predetermined criteria.” See Examiner’s Answer page 10. The Examiner then asserts that Lyons teaches antenna selection diversity based on a predetermined criteria. The Examiner then concludes:

it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wright, Suzuki with Lyons’ maintaining data quality at 5%, in order to improve the previously determined sequentially antenna selection by maintaining the data error rate low at 5%. *ibid.*

The Applicant respectfully disagrees with the assertion, set forth in the Examiner’s Answer as cited above, that the combination of Wright, Suzuki and Lyons teaches selecting a starting antenna based on a predetermined criteria as recited in claims 3, 13 and 23. For support, the Applicant begins by referring to the plain meaning of the language in Lyons. Lyons teaches:

The antenna controller 1109 (FIG. 11) *selects a first antenna*, and then obtains a measure of the signal quality for the first antenna, *then switches to the second antenna* and obtains a measure of the signal quality for the second antenna, then selects one of the antennas as the antenna for receiving from the remote station according to the signal quality measure (emphasis added). (Lyons, column 9, lines 14-20).

Relying on the plain meaning of the language cited above, **Lyons teaches away** from the suggestion of selecting a *starting antenna* based on a predetermined criteria since Lyons teaches that the EVM criteria is utilized for antenna selection after selecting a first antenna and a second antenna. The Applicant therefore asserts that the combination of Wright, Suzuki and Lyons does not teach “selecting said starting antenna based on a predetermined criteria” as is recited by claims 3, 13 and 23.

In response to the arguments set forth with respect to claims 3, 13 and 23 in the Appeal Brief, the Examiner's Answer attempts to buttress the above-mentioned rationale for rejecting claims 3, 13 and 23 by relying on Figure 4 from Wright. See Examiner's Answer, page 16. From this basis, the Examiner asserts: “Wright does teach the antenna selection based on the predetermined criteria, SQI=Good in step 170 of the control function in step 107 of Fig. 4 before set antenna selection switch 14 in step 114 of Fig. 4.” *ibid*. The Examiner then concludes that “Wright, Suzuki does teach the selecting said starting antenna based on a predetermined criteria.”

The Applicant once again respectfully disagrees with the Examiner's conclusions. The Applicant again supports this position by referring to the teachings in Wright. Wright teaches that the signal quality estimate is based on: an estimated frequency variance, an estimated timing variance and an estimated signal strength measurement for the current frame (Wright, column 5, lines 63-67 and column 6, lines 1-9). Wright also teaches that the signal quality indicator (SQI) is determined based on the estimated signal strength measurement (Wright, column 6, lines 64-67, column 7,

lines 1-2). The Applicant respectfully asserts that the signal strength measurement, and therefore the SQI value, would be determined after selecting an antenna to receive the signals that are measured to determine the signal strength estimate. The Applicant therefore respectfully submits that Wright does not teach a method for determining either a received signal strength indication (RSSI) value or an SQI value *before* selecting a starting antenna.

The Applicant respectfully asserts that the Examiner has not explained how Wright teaches a method by which an RSSI measurement may be obtained *before* selecting a starting antenna. Since the Examiner has not explained how the RSSI value is determined before selecting a starting antenna, the Applicant respectfully asserts that the Examiner has therefore also not explained how Wright teaches a method by which the SQI value, which is determined based on the RSSI value, may be determined *before* selecting a starting antenna. The Applicant therefore concludes that the Examiner has not explained how the SQI value may be used *to select a starting antenna*. The Applicant therefore asserts that the combination of Wright and Suzuki does not teach “selecting said starting antenna based on a predetermined criteria” as is recited by claims 3, 13 and 23.

The Applicant therefore maintains that claims 3, 13 and 23 are allowable at least for the above reasons. The Applicant also maintains the arguments made with respect to claims 3, 13 and 23 in the Appeal Brief.

D. Rejection of Independent Claims 1, 11 and 21

The Applicant next turns to the rejection of claims 1, 11 and 21 under 35 U.S.C. 102(e) as being anticipated by Wright. The Applicant respectfully disagrees with the assertion that claims 1, 11 and 21 are anticipated by Wright.

Wright teaches a sequence of events in which an antenna selection is performed prior to determination of a gain level. More specifically, with reference to FIG. 3 from Wright, the sequence of events taught by Wright comprises:

1. selection of one of a plurality of antennas (elements 10 and 12) for receiving signals at a base station receiver (see Wright column 4, lines 19-26); and
2. determination of a gain level (elements 15, 17 and 19) by using received data, frequency variance (Fvar), timing variance (Tvar) and RSSI (see Wright column 4, lines 60-64).

The Applicant respectfully submits that the assertions set forth in the Examiner's Answer suggest that the Examiner agrees that Wright teaches the above-mentioned sequence:

Wright teaches, in Fig. 4, the antenna selection at step 108 [Fig. 4] *before* executing the gain control procedure 110... (emphasis added) See Examiner's Answer, page 14.

The Applicant respectfully submits that the sequence taught in Wright does not anticipate the sequence recited in claims 1, 11 and 21. Wright does not teach "determining a gain...(clause 2)" followed by "selecting for signal processing a portion of said dwelled-on at least one of a plurality of antennas...(clause 4)" as is recited in claims 1, 11 and 21. The Applicant therefore asserts that Wright does not anticipate

claims 1, 11 and 21.

The Applicant stands by the arguments made with respect to claims 1, 11, and 21 in the Appeal Brief. The Applicant respectfully submits that independent claims 1, 11 and 21 are allowable at least for the reasons stated therein.

E. Rejection of Dependent Claims 2, 4, 7, 9, 10, 12, 14, 17, 19, 20, 22, 24, 27, 29 and 30

The Applicant stands by the arguments made with respect to claims 2, 4, 7, 9, 10, 12, 14, 17, 19, 20, 22, 24, 27, 29 and 30 in the Appeal Brief. The Applicant respectfully submits that dependent claims 2, 4, 7, 9, 10, 12, 14, 17, 19, 20, 22, 24, 27, 29 and 30 are allowable at least for the reasons stated with regard to claims 1, 11 and 21.

CONCLUSION

The Applicant submits that the pending claims that are the subject of the Appeal Brief are allowable in all respects. Reversal of the Examiner's rejections for all the pending claims and issuance of a patent on the Application are therefore requested from the Board.

The Commissioner is hereby authorized to charge additional fee(s) or credit overpayment(s) to the deposit account of McAndrews, Held & Malloy, Ltd., Deposit Account № 13-0017.

Respectfully submitted,

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By: /Ognyan I. Beremski/
Ognyan Beremski, Reg. No. 51,458
Attorney for Applicant

McANDREWS, HELD & MALLOY, LTD.
500 West Madison Street, 34th Floor
Chicago, Illinois 60661
Telephone: (312) 775-8000
Facsimile: (312) 775 – 8100
(rhd)